***Efficient Embedded Course***

**INTERRUPT DEMONSTRATION NOTES**

**Issue 1.0**

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# Introduction

## Lab overview

The interrupt demonstration uses an ISR to detect when a switch is pressed and increment a counter variable each time. The RGB LEDs are lit according to the three LSBs of the counter variable.

# Requirements

In this lab, we will be using the following hardware and software:

* **KEIL µVision5 MDK IDE**
  + Please check the Getting Started with KEIL guide on how to download and install it.
* **STM32 Nucleo-F401RE**
  + For more information, click [here](https://www.st.com/en/evaluation-tools/nucleo-f401re.html).
* **RGB LED**

# Hardware Setup

Connect the switch signal to the GPIO port input on the MCU as shown in table below. Connect the debug signals and the switch signal to a logic analyzer or oscilloscope. This matches the pins used in the supplied code.

Table . Signals and connections

|  |  |  |  |
| --- | --- | --- | --- |
| Signal Name | Description | Direction | MCU |
| SW1 | Switch Input | Input to MCU | PC\_13 |
| DBG\_Main | Main Thread Debug Output | Output from MCU | PC\_6 |
| DBG\_ISR | ISR Debug Output | Output from MCU | PC\_8 |

A picture containing diagram

Description automatically generated

Figure . Nucleo-F401RE I/O connectors.